

EXHIBIT A

Expert Report of William E. Longo, Ph.D.,
Prepared on Behalf of the Property Damage
Asbestos Claimants Represented by the
Law Firm of Dies & Hile, LLP

Appendix A

State of Arizona – Dust Reentrainment Study

October 25, 2006

M40816



M40816

ARIZONA STUDY

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SECTION 1

Location & Parameters of Dust Re-Entrainment Trials

Following a brief visual inspection of the attic space above the Music Hall, MAS selected an area just inside and to the left of the 5th floor stairwell access door for the first three of four trials. This area provided easy accessibility to broad sections of the HVAC system ductwork and needed electrical power for supplementary lighting. The fourth trial was conducted in an area located near the center of the attic accessed by catwalks.

The basic design for this experiment consists of the collection of personnel air samples during re-entrainment of settled dust from Grace Monokote III fireproofing. Four separate trials which were performed to re-entrain the dust present in the attic space. Each trial relied on a different mechanism for disturbance of the dust. In general these re-entrainment mechanisms were selected to replicate common maintenance activities.

Two employees of MAS participated in each trial of the experiment. Both experiment participants wore disposable protective coveralls and donned full face powered air purifying respirators. In addition, each participant donned two low volume personnel air sampling pumps with attached 25mm mixed cellulose ester (MCE) filters on either shoulder. With this configuration a total of four air samples were obtained for each trial. Samples were collected in the breathing zone for each participant at flow rates of 1.5 and 2.5 liters per minute respectively for each sample. The sampling period for each trial was limited to the actual time necessary to perform the given disturbance.

Trial I – Rag Cleaning

In this trial, settled dust was re-trained into the air by use of a cloth rag. Newly purchased cloth rags were used by experiment participants to manually remove the accumulated dust from the top of a metal HVAC duct. The duct selected for this trial is trapezoidal in shape with the approximate dimensions of 26" top x 42" bottom x 38"sides. Light hand pressure was applied to the rags to remove the dust via broad sweeping arm motions over the entire duct surface area. During the trial, one half of the duct surface was cleaned by one participant and then subsequently the opposite side cleaned by the other participant (refer to photographs 3 thru 6). Air samples were collected during this trial over a four minute period.

Trial II – Hand Brushing

In this trial, settled dust was re-trained into the air by use of a small hand brush and dust pan. A newly purchased brush and pan were used to manually remove the accumulated dust from the top of a metal HVAC duct. The duct selected for this trial is trapezoidal in shape with the approximate dimensions of 26" top x 42" bottom x 38"sides. Light hand pressure was applied to the brush to sweep the dust off one-half of the duct surface using long brush strokes. The opposite half of the duct surface was then cleaned by the other participant using moderate hand pressure and short brush strokes. The accumulated dust captured in the dust pan was subsequently deposited in a Ziploc bag and retained for future analysis (refer to photographs 7 thru 10). Air samples were collected during this trial over a four minute period.

Trial III – Compressed Air Blow Off

In this trial, settled dust was re-trained into the air using of a small canister of compressed air. The air from the canister was used to blow-off the accumulated dust from the top of a metal HVAC duct. The duct selected for this trial is rectangular in shape with the approximate dimensions of 47" wide x 54" tall. Compressed air was released from the can at a distance of approximately 18" from the duct surface. One half of the duct surface was blown-off by one

participant and then opposite side was blown-off by the other participant (refer to photographs 11 thru 14). A total of 109 grams of compressed air were used. Air samples were collected during this trial over a four minute period.

Trial IV – Insulation Batt Removal and Replacement

In this trial, settled dust was re-entrained into the air by lifting and replacement of fiberglass batt insulation. Pink colored fiberglass insulated batting (in 24" x 48" sections) are utilized in the attic space above the music hall ceiling. Two of these insulation batts were removed by each of the experiment personnel from their installed location and temporarily place atop adjacent batting to provide access the ceiling deck below. After approximately one minute the removed batts were placed back in their original location (refer to photographs 15 and 16). Air samples were collected during this trial over a four minute period.

Analysis

Following the conclusion of the subject experiment, air samples obtained during the four trials were transported back to MAS's Suwannee, Georgia laboratory and submitted for analysis.

Phase Contrast Microscopy

A quarter wedge was removed from each of the 16 air samples and prepped for analysis by Phase Contrast Microscopy (PCM) in accordance with the NIOSH 7400 method. The results of these analyses were reported in structures per cubic centimeter of air for comparison to the OSHA excursion limit.

Transmission Electron Microscopy

A portion of the remaining filter from each of the 16 air samples was prepped following MAS's SOP "Direct Preparation Methodology for Air Filter Analysis by TEM". Two grids from each of the filters were then analyzed by Transmission Electron Microscopy in accordance with EPA's AHERA methodology. During this analysis fiber sizes (lengths and breadths) were recorded for each of the asbestos fibers and bundles counted. In addition, representative photographs were taken of each sample to document filter loading, fibers sizes and presence of free asbestos fibers. Calculated asbestos fiber concentrations are reported in asbestos structures per millimeter square of filter area and asbestos structures per cubic centimeter of air.

SECTION 2



Materials Analytical Services
Air Sample / Dust Sample
Chain-of-Custody

Air Sample / Dust Sample
Chain-of-Custody

Sample #	Date	Sample Type & Description	Activity	Sample Parameters	Comments
1	10/9/2006	Personnel Air - R. Hatfield - Left Shoulder	Trial I - Rag Cleaning of HVAC Duct	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
2	10/9/2006	Personnel Air - R. Hatfield - Right Shoulder	Trial I - Rag Cleaning of HVAC Duct	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
3	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial I - Rag Cleaning of HVAC Duct	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
4	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial I - Rag Cleaning of HVAC Duct	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
5	10/9/2006	Personnel Air - R. Hatfield - Left Shoulder	Trial II - Hand Brushing of HVAC Duct*	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
6	10/9/2006	Personnel Air - R. Hatfield - Right Shoulder	Trial II - Hand Brushing of HVAC Duct*	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
7	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial II - Hand Brushing of HVAC Duct*	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
8	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial II - Hand Brushing of HVAC Duct*	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
9	10/9/2006	Personnel Air - R. Hatfield - Left Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	1.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
10	10/9/2006	Personnel Air - R. Hatfield - Right Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	2.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
11	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	1.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
12	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	2.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
13	10/9/2006	Personnel Air - R. Hatfield - Left Shoulder	Trial IV - Insulation Batt Removal and Replacement	1.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
14	10/9/2006	Personnel Air - R. Hatfield - Right Shoulder	Trial V - Insulation Batt Removal and Replacement	2.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
15	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial IV - Insulation Batt Removal and Replacement	1.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
16	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial IV - Insulation Batt Removal and Replacement	2.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
17	10/9/2006	Field Blank	NA	NA	Exposed after Trials
18	10/9/2006	Field Blank	NA	NA	Exposed after Trials
19	10/9/2006	Contaminated Rag from Clearing	Rag Cleaning of HVAC Duct	NA	Delaminated Fireproofing Dust
20	10/9/2006	Collected Dust from Hand Brushing	Hand Brushing of HVAC Duct	NA	Delaminated Fireproofing Dust

Sampled by: Martin Bennett & Richard Hatfield

Turnaround Time: X standard or rush

Received: _____ Date: _____

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MAS

Materials Analytical Services

Air Sample / Dust Sample
Chain-of-Custody

Sample #	Date	Sample Type & Description	Activity	Sample Parameters	Comments
1	10/9/2006	Personnel Air - R. Haffield - Left Shoulder	Trial I - Rag Cleaning of HVAC Duct	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
2	10/9/2006	Personnel Air - R. Haffield - Right Shoulder	Trial I - Rag Cleaning of HVAC Duct	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
3	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial I - Rag Cleaning of HVAC Duct	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
4	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial I - Rag Cleaning of HVAC Duct	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
5	10/9/2006	Personnel Air - R. Haffield - Left Shoulder	Trial II - Hand Brushing of HVAC Duct*	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
6	10/9/2006	Personnel Air - R. Haffield - Right Shoulder	Trial II - Hand Brushing of HVAC Duct*	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
7	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial II - Hand Brushing of HVAC Duct*	1.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
8	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial II - Hand Brushing of HVAC Duct*	2.5 l/m for 4 mins	Disturbed Surface Area = 8.74 ft ²
9	10/9/2006	Personnel Air - R. Haffield - Left Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	1.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
10	10/9/2006	Personnel Air - R. Haffield - Right Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	2.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
11	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	1.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
12	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial III - Compressed Air Blow Off of HVAC Duct	2.5 l/m for 3 mins	Disturbed Surface Area = 17.6 ft ²
13	10/9/2006	Personnel Air - R. Haffield - Left Shoulder	Trial IV - Insulation Batt Removal and Replacement	1.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
14	10/9/2006	Personnel Air - R. Haffield - Right Shoulder	Trial IV - Insulation Batt Removal and Replacement	2.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
15	10/9/2006	Personnel Air - M. Bennett - Left Shoulder	Trial IV - Insulation Batt Removal and Replacement	1.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
16	10/9/2006	Personnel Air - M. Bennett - Right Shoulder	Trial IV - Insulation Batt Removal and Replacement	2.5 l/m for 4 mins	Disturbed Surface Area = 32 ft ²
17	10/9/2006	Field Blank	NA	Exposed after Trials	
18	10/9/2006	Field Blank	NA	Exposed after Trials	
19	10/9/2006	Contaminated Rag from Cleaning	Rag Cleaning of HVAC Duct	NA	Delaminated Fireproofing Dust
20	10/9/2006	Collected Dust from Hand Brushing	Hand Brushing of HVAC Duct*	NA	Delaminated Fireproofing Dust

Sampled by: Martin Bennett & Richard Hatfield

Turnaround Time: X standard or rush

1105

Mosses Date: 10/11/06

**MATERIALS ANALYTICAL SERVICES
PROJECT COC**

MAS ID:	M40816	Client Job No:	
Client Name:	Dies and Hile, LLP	Client PO:	
Project Name:	Tuscon Convention Center Music Hall 5th	Date In:	10/11/2006
Logged By:	dmazzaferro	Client Code:	0380

TRANSPORT INFORMATION:

Submitted By:	Martin Bennett	Documents:	COC
Delivery By:	Hand Delivery		
Received By:	dmazzaferro		
Condition:	good	Comments for COC:	

CONTACT INFORMATION:

Contact:	Richard Hatfield	Work Phone:	(770) 866-3204	Ext:	
Title:	First Name	Last Name:	Suffix	Other Phone	Ext:
Mr.	Richard	Hatfield		Fax:	(770) 866-3259

SAMPLE INFORMATION:

#	Client ID	Volume	#	Client ID	Volume
001	1	6	017	17	0
002	2	10	018	18	0
003	3	6			
004	4	10			
005	5	6			
006	6	10			
007	7	6			
008	8	10			
009	9	4.5			
010	10	7.5			
011	11	4.5			
012	12	7.5			
013	13	6			
014	14	10			
015	15	6			
016	16	10			

SIGNATURES

RECEIVED BY: _____ ANALYZED BY: _____

REVIEWED BY: _____ REPORTED BY: _____

PREPARED BY: _____ DEPOSED BY: _____

**MATERIALS ANALYTICAL SERVICES
PROJECT COC**

MAS ID:	M40817	Client Job No:	
Client Name:	Materials Analytical Services Atlanta	Client PO:	
Project Name:	Tuscon Convention Center Music Hall 5th	Date In:	10/11/2006
Logged By:	dmazzaferro	Client Code:	MASCORP

TRANSPORT INFORMATION:

Submitted By:	Martin Bennett	Documents:	COC
Delivery By:	Hand Delivery		
Received By:	dmazzaferro		
Condition:	good	Comments for COC:	

CONTACT INFORMATION:

Contact:	Richard Hatfield	Work Phone:	(770) 866-3204	Ext:	
Title:	First Name Last Name:	Suffix	Other Phone	Ext:	
Mr.	Richard Hatfield		Fax:	(770) 866-3259	

SAMPLE INFORMATION:

#	Client ID	Volume	#	Client ID	Volume
001	19				
002	20				

SIGNATURES

RECEIVED BY:		ANALYZED BY:	
REVIEWED BY:		REPORTED BY:	
PREPARED BY:		DEPOSED BY:	

SECTION 3



Materials Analytical Services

Air Sample

Summary of Results

Project No.: 16100601 Date: 10/11/06

Location: Tuscon Convention Center (TCC) Music Hall - 5th floor Attic
City/State: Tuscon, AZ

* - No fibers detected (NFD)

** - No asbestos detected (NAD)

SECTION 4

Phase Contrast Microscopy Analysis

Materials Analytical Services Airborne Fiber Analysis NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name:

Sample # H 40 816 - 001

Analysis Date: 10/16/06

Media Type: 25 mm MCE Filter

Sample ID:	1
Pump Flow Rate, Liters/minute (FR)	
Sample Time, minutes (T)	
Sample Volume, Liters (V)	6
Total Fibers Counted, Sample (FCS)	3
Total Fields Counted, Sample (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank (FLB)	100
Area of Filter, mm ² (AF)	385
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
E =	ND, 47 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
C =	10.449 fibers/cubic centimeter

Limit of Quantitation (LOQ) = 7 fibers/mm²

^aFiber counts outside the 100-1300 fibers/mm² range have greater than estimated error.

Analyst: W. B. Sull

Date: 10/16/06

Reviewed By:

Date:

Materials Analytical Services
3945 Lakefield Court
Suwanee, GA 30024
Phone (770) 866-3200

Page _____ of _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: D 40816-002An. Is Date: 10/16/06

Media Type: 25 mm MCE Filter

1	1	~	~	<u>1/2</u>
~	1	~	~	~
1	~	1	~	~
~	~	2	~	~
~	~	2	~	~
~	~	1	~	<u>1/2</u>
~	2	~	1	~
~	1	~	~	~
~	~	<u>1/2</u>	1	~
~	~	~	1	~
~	1	~	1	~
~	~	~	~	~
~	~	1	~	~
~	~	~	~	~
~	~	~	~	1
1	~	<u>1/2</u>	~	~
~	1	3	2	~
1	~	1	~	~
<u>1/2</u>	~	2	~	~

Sample ID:	<u>2</u>
10	Pump Flow Rate, Liters/minute (FR)
20	Sample Time, minutes (T)
30	Sample Volume, Liters (V)
40	Total Fibers Counted, Sample (FCS)
50	Total Fields Counted, Sample (FLS)
60	Total Fibers Counted, Blank (FCB)
70	Total Fields Counted, Blank (FLB)
80	Area of Filter, mm ² (AF)
90	Graticule Field Area, mm ² (GFA)
100	Calculation of Fiber density (E) in Fibers/square millimeter E = ((FCS/FLS)-(FCB/FLB))/GFA E = <u>45.2</u> fibers/mm ²
110	Calculation of Fiber Concentration (C) in Fibers/cubic centimeter C = <u>(E)*(AF)</u> <u>1000 * V</u> C = <u>1.741</u> fibers/cubic centimeter

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: L. B. J. H.Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 1741816-003Analyst Date: 10/16/06

Media Type: 25 mm MCE Filter

		3	1	1
1	2 $\frac{1}{2}$		1	2
1	1 $\frac{1}{2}$	1 $\frac{1}{2}$		2
2 $\frac{1}{2}$		$\frac{1}{2}$	1	1
1	1	2		
	1	2		
$\frac{1}{2}$		$\frac{1}{2}$		
1	1 $\frac{1}{2}$		2 $\frac{1}{2}$	
1 $\frac{1}{2}$			3 $\frac{1}{2}$	2
$\frac{1}{2}$	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$
3	1 $\frac{1}{2}$	$\frac{1}{2}$	1	1
$\frac{1}{2}$	—	—	3	—
1 $\frac{1}{2}$	1 $\frac{1}{2}$	—	—	2
1	2	1	1	—
a	1 $\frac{1}{2}$	4	1 $\frac{1}{2}$	—
1 $\frac{1}{2}$	2	—	—	3 $\frac{1}{2}$
1	1	1	1	—
—	1	1 $\frac{1}{2}$	2	$\frac{1}{2}$
1	—	1	—	1
2 $\frac{1}{2}$	$\frac{1}{2}$	1	—	3

Sample ID:	<u>3</u>
10 Pump Flow Rate, Liters/minute (FR)	
20 Sample Time, minutes (T)	
30 Sample Volume, Liters (V)	<u>6</u>
40 Total Fibers Counted, Sample (FCS)	<u>100</u>
40 Total Fields Counted, Sample (FLS)	<u>97</u>
50 Total Fibers Counted, Blank (FCB)	<u>0</u>
50 Total Fields Counted, Blank (FLB)	<u>100</u>
Area of Filter, mm ² (AF)	<u>385</u>
60 Graticule Field Area, mm ² (GFA)	<u>0.00785</u>
70 Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
80 E =	<u>131.3</u> fibers/mm ²
90 Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
90 C =	<u>8.427</u> fibers/cubic centimeter

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W.B.J.H.Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: MY 816 - 004

Analysis Date: _____

Media Type: 25 mm MCE Filter

1	-	½	-	1
1½	2½	2	2	1
3	2	1	-	-
-	-	1	1½	1
-	2	-	-	-
3	-	1½	-	-
-	-	-	-	1
½	-	1	1	1½
1	½	½	-	-
1	½	2½	1	2
-	1	1	1	-
1	1	1½	-	1
1½	2½	1	1	1
-	½	1	3	½
1½	1	½	2½	1
3	-	2½	1½	2
3	-	½	-	3
1	2	1½	1	3
2	1½	-	2½	-
½	2	1	-	-

Sample ID:	4
Pump Flow Rate, Liters/minute (FR)	
Sample Time, minutes (T)	
Sample Volume, Liters (V)	10
Total Fibers Counted, Sample (FCS)	100
Total Fields Counted, Sample (FLS)	97
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank (FLB)	100
Area of Filter, mm ² (AF)	381
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
E =	131.3 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
C =	5.056 fibers/cubic centimeter

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W. B. JuddDate: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: N40 816-065

Ans. Date: 10/16/06

Media Type: 25 mm MCE Filter

Sample ID:	5
Pump Flow Rate, Liters/minute (FR)	
Sample Time, minutes (T)	
Sample Volume, Liters (V)	6
Total Fibers Counted, Sample (FCS)	8
Total Fields Counted, Sample (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank (FLB)	100
Area of Filter, mm ² (AF)	3.85
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
E =	10.2 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
C =	0.654 fibers/cubic centimeter

Limit of Quantitation (LOQ) = 7 fibers/mm²

Fiber counts outside the 100–1300 fibers/mm² range have greater than optimal visibility and are probably unnecessary.

Comments

W. B. Hill

Date: 10/18/06

Reviewed By

Date:

Materials Analytical Services
3945 Lakefield Court
Suwanee, GA 30024
Phone (770) 866-3200

Page _____ of _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: M40816-006

Anal. As Date: 10/16/06

Media Type: 25 mm MCE Filter

-	-	-	-	-
-	-	-	-	-
-	1	-	-	-
-	-	-	1	-
-	-	-	-	1
-	-	-	2	-
-	2	-	-	-
-	-	1	-	-
-	-	-	-	2
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
1	-	-	-	-
-	2	-	-	-
-	1	-	-	-
1	1	-	-	-

10	Sample ID: 6
20	Pump Flow Rate, Liters/minute (FR)
30	Sample Time, minutes (T)
40	Sample Volume, Liters (V) 10
50	Total Fibers Counted, Sample (FCS) 13
60	Total Fields Counted, Sample (FLS) 100
70	Total Fibers Counted, Blank (FCB) 0
80	Total Fields Counted, Blank (FLB) 100
90	Area of Filter, mm ² (AF) 385
100	Graticule Field Area, mm ² (GFA) 0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
E = ((FCS/FLS)-(FCB/FLB))/GFA	
E = 16.6 fibers/mm ²	
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
C = (E)*(AF) 1000 * V	
C = 0.638 fibers/cubic centimeter	

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.

Analyst: L.B.JH

Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: M40816-007

Analysis Date: 10/16/06

Media Type: 25 mm MCE Filter

1	1	1	-	2
-	3	1½	3	1
1	2	1	2	-
-	2	1	2	-
-	1½	-	-	-
-	-	-	1½	-
-	1	-	-	-
-	1½	-	-	2
3	2	½	1	2
-	2	1	2	½
2½	-	½	1	1
1	1	-	2	1
1	-	½	-	2
1	1	1½	½	-
1½	-	2	1	1½
½	2	-	-	-
1	1	-	-	½
½	-	-	-	1
½	-	2	-	2
-	-	-	2	-

Sample ID:	7
Pump Flow Rate, Liters/minute (FR)	_____
Sample Time, minutes (T)	_____
Sample Volume, Liters (V)	6
Total Fibers Counted, Sample (FCS)	81
Total Fields Counted, Sample (FLS)	100
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank (FLB)	100
Area of Filter, mm ² (AF)	385
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
E = ((FCS/FLS)-(FCB/FLB))/GFA	_____
E =	103.2 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
C = $\frac{(E) * (AF)}{1000 * V}$	_____
C =	6.621 fibers/cubic centimeter

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W.B.J.H.

Date: 10/16/06

Reviewed By: _____

Date: _____

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 3945 Lakefield Court
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 Phone (770) 866-3200

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Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 740816-008Analyst Date: 10/16/06

Media Type: 25 mm MCE Filter

-	-	<u>1/2</u>	-	-
1	-	<u>1/2</u>	-	-
1	-	1	1	-
-	<u>2 1/2</u>	1	1	1
-	1	1	-	-
-	<u>1/2</u>	1	1	2
1	1	2	-	1
-	1	1	1	1
<u>1/2</u>	-	-	-	1
1	-	-	-	1
1	-	<u>1/2</u>	-	-
<u>1/2</u>	1	-	-	1
-	1	-	<u>1/2</u>	-
?	-	-	1	-
-	-	-	1	-
1	1	1	-	1
-	-	1	1	1
2	<u>1/2</u>	<u>1/2</u>	-	-
1	-	-	-	-
1	-	-	-	1

10	Sample ID:	<u>8</u>
20	Pump Flow Rate, Liters/minute (FR)	_____
30	Sample Time, minutes (T)	_____
40	Sample Volume, Liters (V)	<u>10</u>
50	Total Fibers Counted, Sample (FCS)	<u>52</u>
60	Total Fields Counted, Sample (FLS)	<u>100</u>
70	Total Fibers Counted, Blank (FCB)	<u>0</u>
80	Total Fields Counted, Blank (FLB)	<u>100</u>
90	Area of Filter, mm ² (AF)	<u>385</u>
100	Graticule Field Area, mm ² (GFA)	<u>0.00785</u>
Calculation of Fiber density (E) in Fibers/square millimeter		
$E = ((FCS/FLS)-(FCB/FLB))/GFA$		
$E = \underline{66.2}$ fibers/mm ²		
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter		
$C = \frac{(E)*(AF)}{1000 * V}$		
$C = \underline{2.550}$ fibers/cubic centimeter		

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W.B. JuddDate: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample # M YO 8/6-009Analysis Date: 10/16/06

Media Type: 25 mm MCE Filter

$\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1	$\frac{1}{2}$
—	1	—	1	1
1	—	—	$\frac{1}{2}$	—
—	—	—	$\frac{1}{2}$	3
—	1 $\frac{1}{2}$	—	1 $\frac{1}{2}$	1
1	2 $\frac{1}{2}$	—	3	$\frac{1}{2}$
1	1	3	$\frac{1}{2}$	1
—	—	$\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$
—	2	$\frac{1}{2}$	—	—
—	—	1	1	1
1 $\frac{1}{2}$	1 $\frac{1}{2}$	—	1	2
—	1	1	1	$\frac{1}{2}$
—	1 $\frac{1}{2}$	1	1	—
—	—	1	—	—
—	—	1	1	1
—	—	1	—	—
—	2	1	1	—
2	1 $\frac{1}{2}$	1	1 $\frac{1}{2}$	2

10	Sample ID:	9
20	Pump Flow Rate, Liters/minute (FR)	_____
30	Sample Time, minutes (T)	_____
40	Sample Volume, Liters (V)	4.5
50	Total Fibers Counted, Sample (FCS)	78 $\frac{1}{2}$
60	Total Fields Counted, Sample (FLS)	100
70	Total Fibers Counted, Blank (FCB)	0
80	Total Fields Counted, Blank (FLB)	100
90	Area of Filter, mm ² (AF)	385
100	Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter		
$E = ((FCS/FLS)-(FCB/FLB))/GFA$		
$E = 100 \text{ fibers/mm}^2$		
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter		
$C = \frac{(E)*(AF)}{1000 * V}$		
$C = 8.556 \text{ fibers/cubic centimeter}$		

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: L. B. JellDate: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 740816-010Anal. Date: 10/16/06

Media Type: 25 mm MCE Filter

3	2	-	1	$\frac{1}{2}$
1	$\frac{1}{2}$	1	-	-
2	-	$\frac{1}{2}$	1	-
-	-	1	1	-
1	1	-	-	-
$\frac{1}{2}$	2	1	1	-
-	3	1	1	1
-	$\frac{1}{2}$	-	$\frac{1}{2}$	1
1	-	1	$\frac{1}{2}$	4
-	2	2	$\frac{1}{2}$	1
4	-	1	2	-
-	-	2	-	3
1	1	-	-	1
1	$\frac{1}{2}$	-	$\frac{1}{2}$	1
1	1	1	$\frac{1}{2}$	-
-	-	1	2	-
2	-	1	1	-
-	-	1	4	1
1	-	1	$\frac{1}{2}$	-
1	-	1	1	$\frac{1}{2}$

Sample ID:	<u>10</u>
Pump Flow Rate, Liters/minute (FR)	_____
20 Sample Time, minutes (T)	<u>7.5</u>
Sample Volume, Liters (V)	_____
Total Fibers Counted, Sample (FCS)	<u>89</u>
40 Total Fields Counted, Sample (FLS)	<u>100</u>
Total Fibers Counted, Blank (FCB)	<u>0</u>
50 Total Fields Counted, Blank (FLB)	<u>100</u>
Area of Filter, mm ² (AF)	<u>385</u>
60 Graticule Field Area, mm ² (GFA)	<u>0.00785</u>
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
80 E =	<u>113.4</u> fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E)*(AF)}{1000 * V}$	
C =	<u>5.820</u> fibers/cubic centimeter

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W.B.J.H.Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 740 816-01Anal. Date: 10/16/06

Media Type: 25 mm MCE Filter

-	2	-	-	<u>1/2</u>
-	-	2	<u>1</u>	<u>2</u>
<u>1/2</u>	<u>1/2</u>	-	-	-
1	-	-	1	-
<u>1/2</u>	1	2	-	<u>1/2</u>
-	-	-	1	-
-	-	2	<u>1</u>	-
2	1	<u>1/2</u>	-	-
2	-	-	<u>1/2</u>	-
1	-	1	1	-
-	-	-	-	-
1	1	-	-	-
1	1	<u>1/2</u>	-	-
-	-	<u>1/2</u>	1	1
1	1	2	-	<u>1/2</u>
-	-	-	-	<u>2 1/2</u>
-	<u>1/2</u>	-	1	<u>1/2</u>
-	1	3	<u>1</u>	-
-	-	-	-	-
-	2	-	-	-

Sample ID:	<u>11</u>
10 Pump Flow Rate, Liters/minute (FR)	
20 Sample Time, minutes (T)	
30 Sample Volume, Liters (V)	<u>4.5</u>
40 Total Fibers Counted, Sample (FCS)	<u>54</u>
50 Total Fields Counted, Sample (FLS)	<u>100</u>
60 Total Fibers Counted, Blank (FCB)	<u>0</u>
70 Total Fields Counted, Blank (FLB)	<u>100</u>
80 Area of Filter, mm ² (AF)	<u>385</u>
90 Graticule Field Area, mm ² (GFA)	<u>0.06785</u>
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
100 E =	<u>68.8</u> fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E)*(AF)}{1000 * V}$	
C =	<u>5.885</u> fibers/cubic centimeter

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W. B. JellDate: 10/16/06

Reviewed By: _____

Date: _____

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Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 740816-012Analysis Date: 10/16/06

Media Type: 25 mm MCE Filter

3	-	-	-	<u>1</u> <u>2</u>
1	-	<u>1</u> <u>2</u>	-	<u>1</u> <u>2</u>
2	3	3	-	<u>1</u> <u>2</u>
1	2	-	<u>1</u> <u>2</u>	-
1	-	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
-	4	-	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
1	1	1	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
3	<u>1</u> <u>2</u>	2	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
-	<u>1</u> <u>2</u>	2	-	<u>1</u> <u>2</u>
2	-	<u>1</u> <u>2</u>	2	-
<u>1</u> <u>2</u>	<u>3</u> <u>2</u>	-	<u>1</u> <u>2</u>	-
-	<u>1</u> <u>2</u>	2	<u>1</u> <u>2</u>	-
-	1	1	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
1	<u>1</u> <u>2</u>	-	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
4	-	2	<u>1</u> <u>2</u>	-
-	-	-	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>
1	2	-	-	<u>1</u> <u>2</u>
1	1	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	-

Sample ID:	<u>12</u>
Pump Flow Rate, Liters/minute (FR)	
Sample Time, minutes (T)	
Sample Volume, Liters (V)	<u>7.5</u>
Total Fibers Counted, Sample (FCS)	<u>101</u>
Total Fields Counted, Sample (FLS)	<u>83</u>
Total Fibers Counted, Blank (FCB)	<u>0</u>
Total Fields Counted, Blank (FLB)	<u>100</u>
Area of Filter, mm ² (AF)	<u>385</u>
Graticule Field Area, mm ² (GFA)	<u>0.00785</u>
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
E =	<u>155.0</u> fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
C =	<u>7.957</u> fibers/cubic centimeter

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W.B. ShullDate: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 1740816-013

An. /s Date: 10/16/06

Media Type: 25 mm MCE Filter

1			
1			
1	1/2		
1		1/2	1/2
1/2	1		
1			
1	1/2		
1		1	1
1			
2		2	
2			1/2
1/2		1/2	
1			1
1/2			
			—

Sample ID:	13
10 Pump Flow Rate, Liters/minute (FR)	
20 Sample Time, minutes (T)	
30 Sample Volume, Liters (V)	6
40 Total Fibers Counted, Sample (FCS)	23 1/2
50 Total Fields Counted, Sample (FLS)	100
Total Fibers Counted, Blank (FCB)	0
50 Total Fields Counted, Blank (FLB)	100
60 Area of Filter, mm ² (AF)	385
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
80 E =	29.9 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E) * (AF)}{1000 * V}$	
C =	1.921 fibers/cubic centimeter

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: W. B. SullDate: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: M40816-014

An. Date: 10/16/06

Media Type: 25 mm MCE Filter

-	1½	1	½	-
1½	-	½	3	1
1½	1	1	4	1
1	1	1	1	-
2	-	1	½	-
1	-	1	1½	1½
3	-	2	1½	1
2½	1	-	1	-
4½	½	2½	2	2
1	½	2	1	-
3	2	1	½	2
2	3	1	-	1
-	1	½	3	½
½	½	-	2	1½
-	3	2	-	-
½	1	1	2	1
2	1½	1	1	-
-	2	2½	-	2
-	½	½	½	-
-	-	1½	2½	1

Sample ID:	14
10	Pump Flow Rate, Liters/minute (FR)
20	Sample Time, minutes (T)
30	Sample Volume, Liters (V)
40	Total Fibers Counted, Sample (FCS)
50	Total Fields Counted, Sample (FLS)
60	Total Fibers Counted, Blank (FCB)
70	Total Fields Counted, Blank (FLB)
80	Area of Filter, mm ² (AF)
90	Graticule Field Area, mm ² (GFA)
100	Calculation of Fiber density (E) in Fibers/square millimeter E = ((FCS/FLS)-(FCB/FLB))/GFA E = 151.7 fibers/mm ² Calculation of Fiber Concentration (C) in Fibers/cubic centimeter C = (E)*(AF) 1000 * V C = 5.839 fibers/cubic centimeter

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.

Analyst: W.B.J.D.

Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: M40 816-015

An. /s Date: 10/16/06

Media Type: 25 mm MCE Filter

-	-	-	1½	1½
1	1½	-	5	-
1	1	-	2	2
1	1	2	4	1
2	2	1	2	1
-	-	1	1	-
-	-	1	2½	1½
½	2	-	1	4
-	-	-	1	½
-	1	1	-	2
-	½	-	3	1
3	-	-	3	2
1	-	1	2½	2½
½	3	-	-	1
-	-	-	-	1
½	-	2	-	2
1	1	1	1	3
½	½	-	3	1
2	-	-	1	-
1	-	3	2	3½

Sample ID:	15
Pump Flow Rate, Liters/minute (FR)	
Sample Time, minutes (T)	
Sample Volume, Liters (V)	6
Total Fibers Counted, Sample (FCS)	102
Total Fields Counted, Sample (FLS)	98
Total Fibers Counted, Blank (FCB)	0
Total Fields Counted, Blank (FLB)	16
Area of Filter, mm ² (AF)	385
Graticule Field Area, mm ² (GFA)	0.00785
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
E =	132.6 fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E)*(AF)}{1000 * V}$	
C =	8.508 fibers/cubic centimeter

Notes: _____

_____Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.

Analyst: L.S. John

Date: 10/16/06

Reviewed By: _____

Date: _____

Materials Analytical Services Airborne Fiber Analysis
NIOSH 7400 Issue 2; Phase Contrast Microscopy

Project Name: _____

Sample #: 1740 816 - 016An. Is Date: 10/16/06

Media Type: 25 mm MCE Filter

1	2	2	—	1
1	—	1	2½	1
1	½	—	1	1
1½	1	½	1	1
1	2½	1	3	2
2	—	1	—	1½
3	4	1½	—	1
1	1½	1	1	1
1	½	½	½	4
—	—	3	2	2
1	—	1	1	½
—	1½	2	2	2½
2½	½	1	—	—
—	—	—	1½	½
—	1	1½	1	2
2	4	—	2	1½
1	—	½	½	2
1	—	1	1	—
1	—	2	1	1
—	—	3	1	—

Sample ID:	<u>16</u>
10	Pump Flow Rate, Liters/minute (FR)
20	Sample Time, minutes (T)
30	Sample Volume, Liters (V)
40	Total Fibers Counted, Sample (FCS)
50	Total Fields Counted, Sample (FLS)
60	Total Fibers Counted, Blank (FCB)
70	Total Fields Counted, Blank (FLB)
80	Area of Filter, mm ² (AF)
90	Graticule Field Area, mm ² (GFA)
Calculation of Fiber density (E) in Fibers/square millimeter	
$E = ((FCS/FLS)-(FCB/FLB))/GFA$	
100	$E = \underline{151.4}$ fibers/mm ²
Calculation of Fiber Concentration (C) in Fibers/cubic centimeter	
$C = \frac{(E)(AF)}{1000 * V}$	
$C = \underline{5.828}$ fibers/cubic centimeter	

Notes: _____

Limit of Quantitation (LOQ) = 7 fibers/mm²Fiber counts outside the 100-1300 fibers/mm² range have greater than optimal variability and are probably biased.Analyst: H. B. J.Date: 10/16/06

Reviewed By: _____

Date: _____